USDA Service Center Agencies
Geospatial Data Management Team
Data Management Plan For

Climate-Precipitation Data

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I. Purpose and Scope (business case)

A. Purpose

The climate information is a product of the Parameter-elevation Regressions on Independent Slopes Model (PRISM). The Spatial Climate Analysis Service of the Oregon Climate Service located at Oregon State University produces the PRISM layers. PRISM incorporates a spatial climate knowledge base that accounts for rain shadows, temperature inversions, coastal effects, and more in the climate mapping process. PRISM data includes:

- Precipitation
- Maximum Temperature
- Minimum Temperature
- Dewpoint
- Standardized Precipitation Index
- Percent of Normal Precipitation

Only precipitation as monthly and annual average is being used at this time because it is the only theme that is available as a vector layer. All others are raster/grid layers.

The purpose of the precipitation data is for display and/or analyses requiring spatially distributed monthly or annual average precipitation for the climatological period 1961-90.

B. Scope

The scope of the dataset is the 48 coterminous states of the United States.

II. Acquisition

A. Data Source

1. Producer Information
   a. Name

      Spatial Climate Analysis Service

   b. Location of Headquarters

      Strand Agriculture Hall, Room 316
      Oregon State University
      Corvallis, OR 97331-2209

   c. Internet Address

http://www.ocs.orst.edu/prism/

2. Publisher Information
   a. Name

      Spatial Climate Analysis Service

   b. Location of Headquarters

      Strand Agriculture Hall, Room 316
      Oregon State University
      Corvallis, OR 97331-2209

   c. Internet Address

      http://www.ocs.orst.edu/prism/

3. Acquisition Information
   a. Delivery Media

      Digital PRISM data sets are available via anonymous File Transfer Protocol (ftp).

   b. Download URL

      http://www.ocs.orst.edu/prism/state_products/us_maps.html

   c. Projected Data Availability Schedule

      The data is currently available.

B. Standards Information

1. Geospatial Data Standard
   a. Standard Name and Steward Information

      United States Department of Agriculture (USDA) Service Center Agencies (SCA) Standard For Geospatial Data

   b. Standard Version

      SCI Std 003-02
      October 15, 2003

   c. Standard URL

      http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDataStandard.pdf

2. Metadata Standard
   a. Standard Name and Steward Information

      Metadata are compliant with:
      Federal Geographic Data Committee (FGDC)
      Content Standard for Digital Geographic Metadata FGDC
      STD-001-1998 Version 2 revised June 1998

      And:

United States Department of Agriculture (USDA) Service Center Agencies (SCA)
Standard For Geospatial Dataset Metadata
SCI Std 003-02 October 15, 2003

http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDatasetFileMetadata.pdf

b. Description of Metadata Captured

A metadata text file is distributed with each PRISM data set. The metadata text file provides information on the content, quality, condition, and other characteristics of the data. The sections of metadata include the following:

Identification_Information
Data_Quality_Information
Spatial_Data_Organization_Information
Spatial_Reference_Information
Entity_and_Attribute_Information
Distribution_Information
Metadata_Reference_Information

c. Metadata Accuracy and Completeness Assessment

The metadata is typically complete.

C. Acquired Data Structure

1. Geospatial Data Format

a. Format (raster, vector, etc.)

The format is vector.

b. Format Name

ESRI exchange (.e00)

c. Data Extent

The extent is the 48 contiguous states of the United States.

d. Horizontal and Vertical Resolution

PRISM is being used to model climate elements and derived variables at a 2.5-minute horizontal resolution using the latitude-longitude coordinate system, resulting in an effective resolution of approximately four kilometers in mid-latitudes. The four-kilometer products are then filtered to an effective resolution twice as fine (approximately 2 kilometers).

e. Absolute Horizontal and Vertical Accuracy

The absolute horizontal accuracy is four kilometers.

Accuracy of this data set is based on the original specification of the Defense Mapping Agency (DMA) 1 degree digital elevation models (DEM). The stated accuracy of the original DEMs are 130 m circular error with 90% probability.

Checks were made to ensure that no two adjacent polygons are labelled with the same precipitation value. A manual spot check was made of peaks, depressions, and islands.

f. Nominal Scale

Maps are made using the 1:250,000 scale DEM, and are displayed at scales ranging from 1:250,000 to 1:2 million. Typically scales are 1:1 million.

g. Horizontal and Vertical Datum

Horizontal datum name: North American datum 1983 (NAD83)
Ellipsoid Name: GRS1980
Semi major Axis: 6378137.0

The vertical datum is mean sea level.

h. Projection

Geographic (longitude/latitude)

i. Coordinate Units

Decimal degrees

j. Average Data Set Size

ARC interchanges files average 31 kilobytes to 910 kilobytes.
The metadata averages 21 kilobytes

k. Symbology

None

2. Attribute Data Format

a. Format Name

The attribute data are distributed as part of the .e00 file

b. Database Size

The attribute data are a part of the .e00 file

3. Data Model

a. Geospatial Data Structure

The vector data is incorporated into the .e00 file.

b. Attribute Data Structure

The attribute data are a part of the .e00 file

c. Database Table Definition

None

d. Data Relationship Definition

The means for linking the attributes to the features is maintained using feature items.

e. Data Dictionary

AREA - Area in square degrees
PERIMETER- Distance around polygon in degrees
COV# - Sequential Feature ID
COVID – Sequential coverage feature ID
RANGE - Fixed value of precipitation for the polygons area
LEGEND- Minimum and maximum range of precipitation for the area

D. Policies

1. Restrictions

a. Use Constraints

No restrictions apply

b. Access Constraints

No restrictions apply

c. Certification Issues

For the attribute data derived from PRISM to be used for program activities, the state Climate Data Liaison must certify the data.

Acknowledgement of the following agencies in products derived from these data: Natural Resources Conservation Service (NRCS) Water and Climate Center, NRCS National Cartography and Geospatial Center (NCGC), PRISM Model, and the Oregon Climate Service at Oregon State University.

Point estimates of precipitation originated from the following sources:

- National Weather Service Cooperative (COOP) stations,
- Natural Resources Conservation Service (NRCS) SNOTEL
- Local networks.

The National Climatic Data Center (NCDC) subjected all COOP station data to quality control checks.

2. Maintenance

a. Temporal Information

1961-90

b. Average -Cycle

Periodic on at least a 10-year update cycle. No updates planned for the 1961-90 climatological period. However, this data set will most likely be updated in 2001 for the new 1971-2000 climatological period.

E. Acquisition Cost

1. Cooperative Agreement

a. Description of Agreement

These data sets have been developed through projects funded partly by the USDA Natural Resources Conservation Service, USDA Forest Service, NOAA Office of Global Programs, and others.

b. Status of Agreement

The agreement is ongoing.

2. Cost to Acquire Data

There is no direct cost.

III. Integration

A. Value Added Process

1. Benefit to the Service Center

A continuous database for the US is created so that any area can be extracted as a shape file. A consistently named FIPS code field is created so that counties and states can easily be extracted.

2. Process Model

a. Flow Diagram

- ❑ All.e00 files for all months for all states are read in to produce ESRI coverage format maps.
- ❑ The coverage maps are saved as a shape file for load to SDE.
- ❑ All attributes except RANGE are deleted.
- ❑ A filed named STATE is added and the state FIPS code value is applied to the field
- ❑ An SDE layer for each month and annual is created
- ❑ All states for the month (or annual) are loaded to the SDE layer.

b. Process Description

For each monthly map and the annual map, the .e00 file for the state is converted to a coverage map. The coverage is converted to a shape file. All attributes except range are deleted. A new state fips code field is created. The annual and monthly shape files are loaded into a layer in SDE.

3. Technical Issues

a. Tiling

None

b. Compression

None

c. Scale

Same as source

d. Tonal Matching

None

e. Edge-matching

None

4. Quality Control

a. Procedures

Plotting and visual review of SDE database

b. Acceptance Criteria

None

5. Data Steward

a. Name and Organization

National Cartography and Geospatial Center
Natural Resources Conservation Service
US Department of Agriculture
501 Felix Street, Building 23
P. O. Box 6567
Fort Worth, Texas 76115-0567 USA

b. Responsibilities

NCGC is responsible for storage and access of the data.

B. Integrated Data Structure

1. Geospatial Data Format

a. Format (raster, vector, etc.)

Vector

b. Format Name

The format name is ESRI ArcSDE

c. Data Extent

The extent is the 48 coterminous states of the United States

d. Horizontal and Vertical Resolution

The resolution is the same as the source data-2.5 kilometers. The vertical datum is mean sea level.

e. Absolute Horizontal and Vertical Accuracy

The accuracy is the same as the source data- four kilometers.

f. Nominal Scale

The scale is the same as the source data-1:1,000,000

g. Horizontal and Vertical Datum

The datum is the same as the source data-NAD83.

h. Projection

The projection is the same as the source data-geographic.

i. Coordinate Units

The coordinate units are the same as the source data-decimal degrees.

j. Symbology

None

2. Attribute Data Format

a. Format Name

The attributes are part of the SDE layer.

b. Database Size

Part of the SDE layer.

3. Data Model

a. Geospatial Data Structure

ArcSDE DBMS tables

b. Attribute Data Structure

ArcSDE DBMS tables

c. Database Table Definition

ArcSDE DBMS tables

d. Data Relationship Definition

ArcSDE DBMS tables

e. Data Dictionary

The dictionary is the same as the source data and includes Range and Contour

C. Resource Requirements

1. Hardware and Software

This is unknown at this time.

2. Staffing

This is unknown at this time.

D. Integration Cost

1. Hardware and Software

This is unknown at this time.

2. Staffing

This is unknown at this time.

IV. Delivery

A. Specifications

1. Directory Structure

a. Folder Theme Data is Stored In

F:\Geodata
\climate
\precipitation

2. File Naming Convention

http://www.itc.nrcs.usda.gov/scdm/docs/SPG-GeospatialDataSetFileNamingStandard.pdf

a. List of Theme Files and The File Naming Convention

Poly Files	
map shp	shp file
map dbf	dbf file
map shx	shx file
map sbn	sbn file
map sbx	sbx file

B. User Information

1. Accuracy Assessment

a. Alignment with Other Theme Geospatial Data

The data is captured at scales varying from 1:250,000 to 1:1 million. There should be some alignment with the ortho-photo layer but this will not be perfect due to the fact that the data is captured at different scales.

b. Content

The mean monthly precipitation estimates were generated by Christopher Daly using the PRISM model (Daly et al. 1994, Daly et al. 1997). Data input to the model consisted of 1961-90 mean monthly precipitation from over 8000 NOAA Cooperative sites, SNOTEL sites, and selected state network stations. Data-sparse areas were supplemented by a total of about 500 shorter-term stations. A station was included in this data set if it had at least 20 years of valid data, regardless of its period of record. Patching together individual state maps for the 11 western states, a central US region, an eastern US region, and a New England region made each

monthly map. PRISM software was used to minimize "seams" along state and region boundaries.

Summing the 12 monthly maps created the annual maps. The annual maps underwent extensive peer-review by many state climatologists and other experts. This is part of a national effort by the USDA Natural Resources Conservation Service and Oregon State University to develop state-of-the-art precipitation maps for each state in the US, including Alaska and Hawaii.

2. Appropriate Uses of the Geospatial Data

a. Display Scale

The scale is the same as the source. 1:250,000 to 1:2 million. Typically scales are 1:1 million.

b. Plot Scale

Typically scales are 1:1 million.

c. Area Calculations

As accurate as the source data and capture scale and the algorithm used by ArcInfo/ArcView

d. Decision Making

As accurate as the source data and capture scale and the algorithm used by ArcInfo/ArcView.

C. Maintenance and Updating

1. Recommendations and Guidelines

a. Original data location and structure

The integrated database is at NCGC and the data is delivered to the Service Center.

b. Update Cycle

When the source data is updated.

c. Availability

Make the updates available as soon as the database is updated.

d. Change Control

This is to be determined.